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MARK SCHEME

Maximum Mark: 96

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MARK SCHEME NOTES

The following notes are intended to aid interpretation of mark schemes in general, but individual mark schemes may include marks awarded for specific reasons outside the scope of these notes.

Types of mark

- M Method marks, awarded for a valid method applied to the problem.
- A Accuracy mark, awarded for a correct answer or intermediate step correctly obtained. For accuracy marks to be given, the associated Method mark must be earned or implied.
- B Mark for a correct result or statement independent of Method marks.

When a part of a question has two or more ‘method’ steps, the M marks are in principle independent unless the scheme specifically says otherwise; and similarly where there are several B marks allocated. The notation ‘**dep**’ is used to indicate that a particular M or B mark is dependent on an earlier mark in the scheme.

Abbreviations

awrt	answers which round to
cao	correct answer only
dep	dependent
FT	follow through after error
isw	ignore subsequent working
nfww	not from wrong working
oe	or equivalent
rot	rounded or truncated
SC	Special Case
soi	seen or implied

Question	Answer	Marks	Partial Marks
1(a)(i)	63	1	
1(a)(ii)	1.25 oe	2	M1 for 25×0.68 oe or $68 - \text{their } 63$ soi or B1 for 17 [.00] or 5 or 0.05 seen
1(a)(iii)	22.5[0]	2	M1 for $15.75 \div 0.70$ or figs 225
1(b)	96.9 or 96.87 to 96.88	3	M2 for $\frac{15.75 - 8}{8}$ or $\frac{15.75}{8} \times 100$ or M1 for $\frac{15.75}{8}$ or $15.75 - 8$
2(a)(i)	–60	1	
2(a)(ii)	–6	1	
2(a)(iii)	6	2	M1 for $50 - 32$ or 18 seen
2(b)	$\frac{3}{5} \times 45$ soi	M1	
	$45 - \text{their } 27$ soi	M1	
	$\text{their } 27 - \text{their } 18$ soi	M1	
	$\max Y = 9 + 5 = 14$ oe	A1	If 0 scored, SC2 for $\left[\frac{3}{5} \times 50 - \frac{2}{5} \times 50 = \right] 10$ and [Max Y =] $10 + 5 = 15$ points or SC1 for $\left[\frac{3}{5} \times 50 - \frac{2}{5} \times 50 = \right] 10$
3(a)(i)	4	1	
3(a)(ii)	2 hours 50 mins	1	
3(b)(i)	3	1	
3(b)(ii)	11 45 oe	3	M2 for [bus journey takes] 10 mins. or M1 for bus leaves at 11 35 or $\frac{4}{24}$ soi
3(c)	4 miles in 30 minutes soi	B1	may be implied by e.g. 2 miles in 15 minutes
	Two consistent, comparable ratios	M1	e.g. speeds, distances in equal time periods etc.
	Comparison of Alice and Paul connected to correct ratios	A1	

Question	Answer	Marks	Partial Marks
4(a)	Correct diagram and key	3	B2 for correct diagram without key or with incorrect key or unordered diagram with key or B1 for diagram with one error and no key or with incorrect key or for diagram with at most 2 errors and key correct or for unordered diagram without key or with incorrect key
	1 9 9 9		
	2 1 5 7		
	3 1 2 3 4 6 8		
	4 0 2 8 9		
	5 0 1		
Key: 1 9 represents 1.9 [°C]			
4(b)	3.2	1	
4(c)	3.35	2	M1 for 3.3 and 3.4 indicated e.g. by circling on diagram or for 9th/10th values indicated e.g. by drawing a line on diagram or for answers of either 3.3 or 3.4 or for an answer figs 335
4(d)(i)	1.9	1	
4(d)(ii)	Valid reason	1	e.g. it is the lowest temperature
5(a)(i)	Correct shape drawn at (− 2, 2) (−4, 4) (−6, 6) (−6, 4)	2	M1 for 3 correct points or correct reflection in $x = k$ or correct reflection in $y = -1$
5(a)(ii)	Correct shape drawn at (2, −6) (4, −4) (6, −2) (6, −4)	2	M1 for 3 correct points or correct x move or correct y move
5(b)	Rotation 90° anti-clockwise or +90° or 270° clockwise or −270° [about] (4, 6)	3	B1 for each
6(a)(i)	711.38	1	
6(a)(ii)	2281.14	1	FT 2992.52 – <i>their</i> 711.38
6(a)(iii)	0.12(2992.52 – 663) seen	M1	
	[£]279.542 or [£]279.5424 seen	A1	
6(b)	3200	2	M1 for 26000 – 10000 oe

Question	Answer	Marks	Partial Marks
6(c)	Yes, with a correct and consistent pair of values compared and linked with correct account	6	M1 for $\frac{2000 \times 2.4 \times 2}{100}$ oe A1 for 96 or 2096 M1 for $2000 \times 1.02 \times 1.02 [-2000]$ oe A1 for 80.8[0] or 2080.8[0] A1 for 96 and 80.8[0] or 2096 and 2080.8[0] seen
7(a)(i)	09 18 or 9.18 [am]	1	
7(a)(ii)	4.5 or $4\frac{1}{2}$ isw	1	
7(b)	3.39	2	B1 for 3.3915 or 3.392 or 3.391 as final answer or M1 for 0.85×3.99 oe seen or for 15% of $3.99 = 0.5985$
7(c)	15	2	M1 for $\frac{21}{2+5}$ or B1 for a final answer of 6 : 15
7(d)	3.75 oe	2	M1 for 5×3 or $\frac{5}{4}$ or $\frac{3}{4}$ oe soi
7(e)(i)	Cross at first tick mark	1	
7(e)(ii)	30	1	
7(f)	Arc of circle, centre Q , radius 6 cm that extends across whole island	2	B1 for arc of circle, centre Q , of any other radius of sufficient length or for arc of circle of 6 cm of insufficient length
	Correct perpendicular bisector of BV with correct arcs	2	B1 for correct bisector of BV with no arcs or correct set of arcs with no line
	Correct region shaded	1	FT <i>their</i> region after at least B1 B1 scored
8(a)	Physics marks are more spread out oe with valid reason [In general] students did better in Maths oe with valid reason Numerical evidence to justify at least one statement isw	3	B1 for each
8(b)	No, with valid reason	1	

Question	Answer	Marks	Partial Marks
9(a)(i)	81	1	
9(a)(ii)	Multiply by 3 oe	1	
9(b)(i)	$-7, -9$	2	B1 for each
9(b)(ii)	$3 - 2n$ oe	2	B1 for $-2n + c$ or for $kn + 3$ ($k \neq 0$)
9(b)(iii)	Forms equation <i>their</i> $3 - 2n = -126$	B1	FT <i>their</i> (b)(ii)
	Correct completion of argument e.g. Shows that n is not an integer or, from $2n = 129$, states 129 is not even	B1	<u>Alternative Method</u> B1 for stating that the sequence $(3 - 2n)$ is always odd and B1 for stating that -126 is even oe
10(a)	$-2.5, -5, -10, \dots 5$	2	B1 for at least 2 correct
10(b)	Both branches of curve correct	4	Branches must not be joined or B3FT for 8 or 7 correctly plotted points or B2FT for 6 or 5 correctly plotted points or B1FT for 4 or 3 correctly plotted points
10(c)	Correct ruled line	1	
10(d)	-1.6 to -1.3	1	
11(a)	Angle in a semi-circle oe	B1	
	$[BC =] \sqrt{9^2 - 4.5^2}$ or $4.5 \tan 60^\circ$ oe	M2	or M1 for $[...]^2 + 4.5^2 = 9^2$ oe or for $\frac{[...]}{4.5} = \tan 60^\circ$ oe
	7.79 or 7.794[...]	A1	method must be seen
11(b)(i)	equilateral	1	
11(b)(ii)	$OA = 4.5$ or $OB = 4.5$ oe	B1	
	Angle $AOB = 60$ soi	B1	
	$\frac{\text{their} 60}{360} \times \pi \times 9$ oe	M1	
	4.71 or 4.712 to 4.713	A1	